



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ :

C08J 9/16, 9/00, C08F 12/08 // C08L 25:06

A3

(11) International Publication Number:

WO 96/15182

(43) International Publication Date:

23 May 1996 (23.05.96)

(21) International Application Number:

PCT/EP95/04511

(22) International Filing Date:

15 November 1995 (15.11.95)

(30) Priority Data:

94203332.5 15 November 1994 (15.11.94) EP

(34) Countries for which the regional or
international application was filed: AT et al.

94203333.3 15 November 1994 (15.11.94) EP

(34) Countries for which the regional or
international application was filed: AT et al.(71) Applicant: SHELL INTERNATIONALE RESEARCH
MAATSCHAPPIJ B.V. [NL/NL]; Carel van Bylandtlaan
30, NL-2596 HR The Hague (NL).(72) Inventors: PALEJA, Rakesh, Jaysinh; Avenue Jean Monnet 1,
B-1348 Ottignies-Louvain-La-Neuve (BE). VLIERS, Do-
minique, Paul; Avenue Jean Monnet 1, B-1348 Ottignies-
Louvain-La-Neuve (BE). WILLEMS, Maria, Johanna; Av-
enue Jean Monnet 1, B-1348 Ottignies-Louvain-La-Neuve
(BE).(81) Designated States: AL, AM, AT, AU, BB, BG, BR, BY, CA,
CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE,
KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK,
MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,
SK, TJ, TM, TT, UA, UG, UZ, VN, European patent (AT,
BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL,
PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,
ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW,
SD, SZ, UG).

Published

With international search report.

(88) Date of publication of the international search report:

1 August 1996 (01.08.96)

(54) Title: EXPANDABLE BEADS BASED ON A POLYMER OF A VINYLAROMATIC COMPOUND CONTAINING BLOWING
AGENT AND PLASTICIZER

(57) Abstract

The invention relates to expandable beads based on a polymer of a vinylaromatic compound having a weight average molecular weight (M_w) in the range of 180,000 to 500,000 and containing a blowing agent and a plasticizer in an amount of 0.1 up to 4 wt.% (as calculated on the total weight of the beads), wherein the plasticizer is an oligomer of styrene and/or alpha-methylstyrene having a number-average molecular weight (M_n) in the range of 200 to 2,000; a process for preparing these expandable beads, and articles of expanded beads, obtainable by expanding and fusing these beads.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 95/04511

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C08J9/16 C08J9/00 C08F12/08 //C08L25:06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C08J C08F C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP,A,0 217 516 (DOW CHEMICAL CO ;DOW CHEMICAL HELLAS (GR)) 8 April 1987	1-9
Y	see page 6, line 10-26 see page 9, line 8 - page 10, line 10 see page 10, line 18-25 see page 11, line 17-24 see page 17, line 1-10 see claims 1-17	8,9
Y	--- US,A,4 520 135 (HAHN KLAUS ET AL) 28 May 1985 see column 1, line 46-57 see column 2, line 15-18 see column 3, line 53-62 see column 6; table see claim 1 --- -/--	1-9

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *&* document member of the same patent family

Date of the actual completion of the international search

16 April 1996

Date of mailing of the international search report

15-05-96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+ 31-70) 340-3016

Authorized officer

Oudot, R

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/EP 95/04511

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BE,A,633 239 (THE DOW CHEMICAL COMPANY) 5 December 1963 -----	1-9

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 95/04511

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0217516	08-04-87	AU-B- 586879	27-07-89
		AU-B- 6117786	19-02-87
		CA-A- 1286165	16-07-91
		DE-A- 3681241	10-10-91
		IE-B- 59305	09-02-94
		JP-B- 7039502	01-05-95
		JP-A- 62104845	15-05-87

US-A-4520135	28-05-85	NONE	

BE-A-633239		DE-B- 1265406	
		FR-A- 1366197	10-11-64
		GB-A- 1036448	
		NL-A- 293626	
		US-A- 3303159	07-02-67

Form PCT/ISA/210 (patent family annex) (July 1992)

THIS PAGE BLANK (USPTO)